

NAME:	SCIENCE TEACHER: (circle code)	10C
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SCIENCE

Year 10 Examination 2013

10C – 40 marks

Make sure that you have answered all the questions in paper 10B before you start this paper.

Time allowed for both examinations: 2 hours

Answer all questions in the spaces provided on the paper.

Show all your working in calculations.

Give units for all answers (eg kg or m) unless they are already provided.

Check you have pages 1-13.

For Teacher Use

<i>Question</i>	1	2	3	4	5	6	7	8	9	<i>Total</i>
<i>Marks gained</i>										
<i>Marks available</i>	4	4	7	6	3	4	4	4	4	40

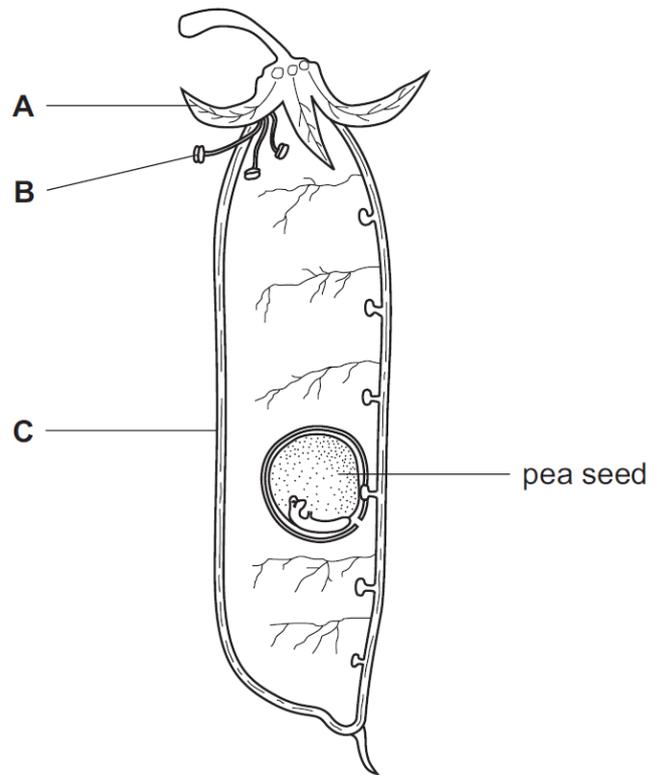
Question One [4 marks]

The ovary of a flower contains one or more ovules.

The ovules contain the ova or eggs.

After fertilisation, an ovule becomes a seed containing an embryo plant.

The diagram shows a pea seed developing inside a pod.



(a) Explain the meaning of fertilisation.

(b) Parts A and B shown in the diagram remain from the flower.

State the name of part A and function (job) of part B of these parts in the flower.

Name of A
Function of B

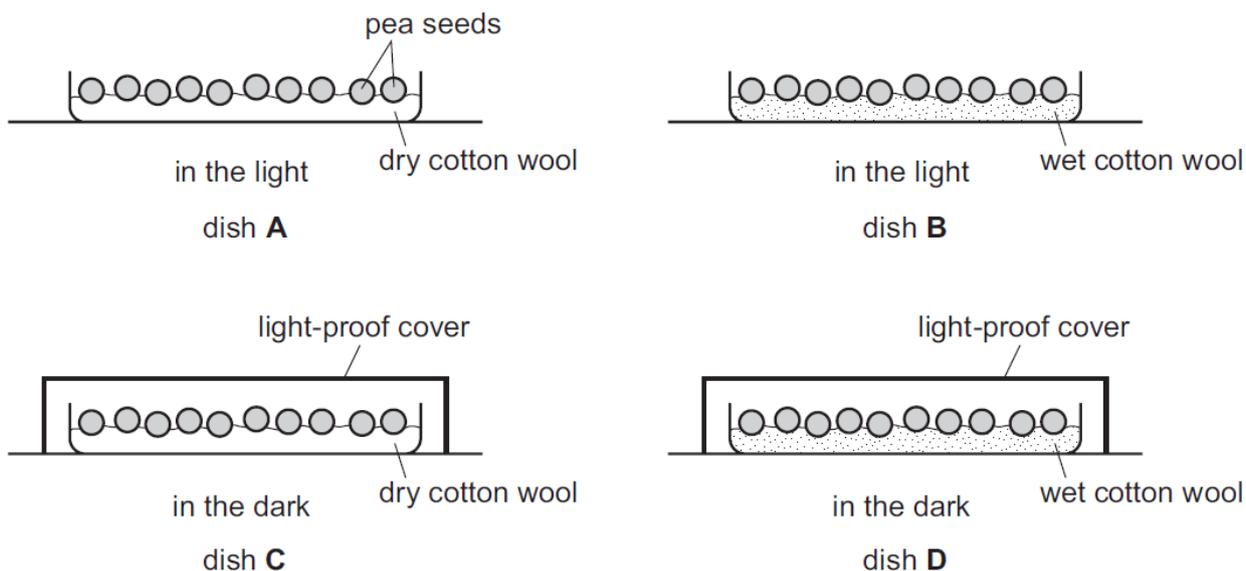
(c) Suggest the part of the flower from which structure C developed.

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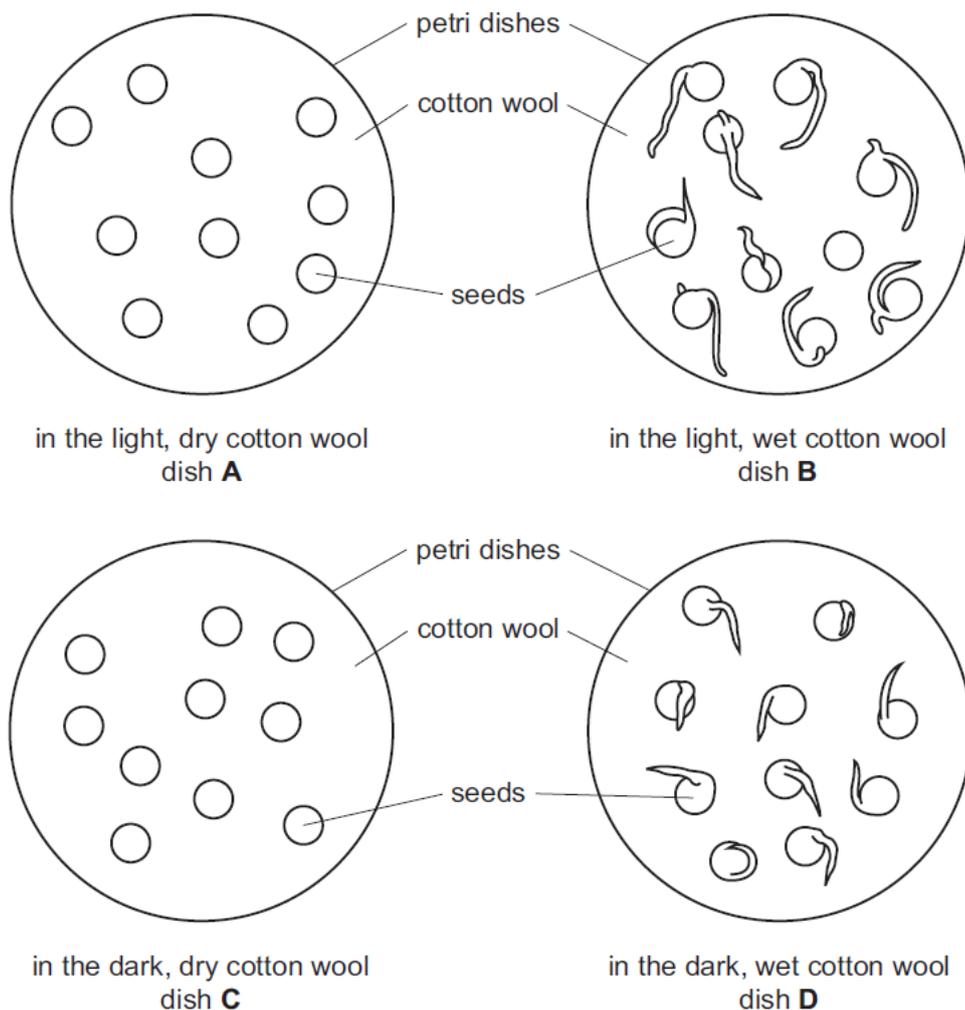


Question Two [4 marks]

In an experiment to investigate some of the conditions needed for seed germination, four petri dishes were set up as shown below. Each petri dish contains some pea seeds. The seeds were soaked in water for 24 hours before being placed in the dishes.



The dishes were then left for 10 days. After 10 days the results were as shown.



- (a) Examine the diagrams and make a note of
- (i) the total number of seeds in each dish,
 - (ii) the number of seeds that have begun to germinate.

Petri dish	A	B	C	D
total number of seeds in the dish				
number of germinating seeds in the dish				

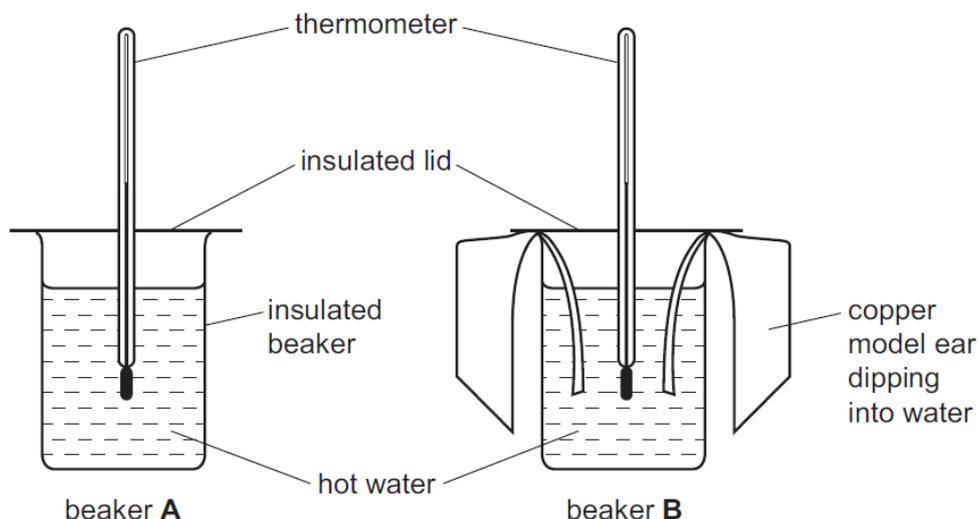
- (b) Use the results to write conclusions about whether light and water are needed for the germination of pea seeds. Refer to experiments A – D in your answer.

- (c) Explain why several seeds were placed in each dish, rather than just one seed.



Question Three [7 marks]

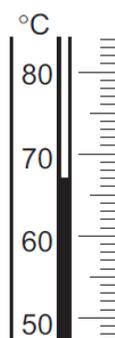
African elephants have big ears to help with temperature control. A student set up an experiment as a model to investigate the effect of large ears. She had two insulated beakers as shown. Both beakers had insulated lids. Beaker B also had two model 'ears' made from copper. The student filled both beakers with hot water, and then took the temperatures of the water every two minutes.



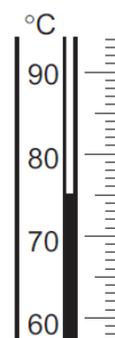
The results are show below.

time / mins	temperature of beaker A / °C	temperature of beaker B / °C
0	84	84
2	83	81
4	81	78
6	78	
8	76	72
10	74	70
12	72	67
14	70	65
16	68	63
18		61
20	65	60

- (a) Read the thermometers and enter the readings in the correct places in the results table.

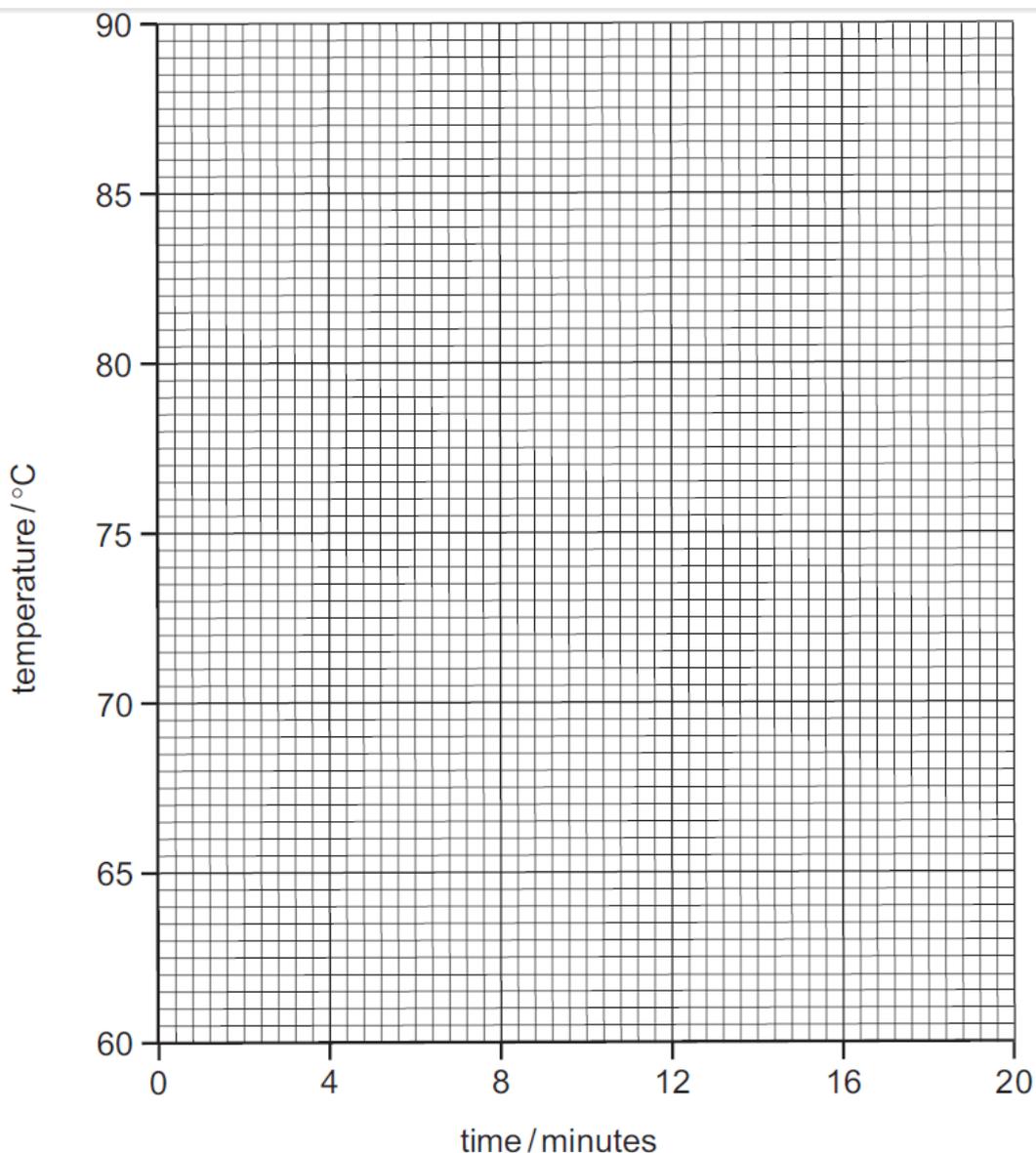


temperature of beaker A at 18 mins



temperature of beaker B at 6 mins

- (b) Plot temperature (vertical axis) against time for beaker A. Draw a smooth curve and label it A.
- (c) Using the same axes plot the results for beaker B and label it B.



Study the results.

- (d) Which beaker cooled more quickly? How do you know?

- (e) Describe two ways the student could make sure the experiment was a fair test.

1.
2.

Question Four [6 marks]

The table below gives the colour of four indicators at different pH values.

Indicator	pH value													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Universal	R	R	O	O	Y	Y	G	B	B	I	I	I	V	V
Methyl Red	R	R	R	R	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Thymol Blue	Y	Y	Y	Y	Y	Y	Y	Y	B	B	B	B	B	B
Alizarin Yellow	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	R	R	R

Key R=Red O=Orange Y=Yellow G=Green B=Blue I=Indigo V=Violet
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Use the information above to answer the following questions.

- (a) What colour is Methyl Red indicator in a solution of pH 7? _____
- (b) What colour is Alizarin Yellow indicator in strong alkali? _____
- (c) What colour is Universal indicator in Hydrochloric acid? _____

A scientist has some acid and is going to add an alkali to it. He needs to stop adding the alkali when the pH value is 7.

- (d) What name is given to the reaction of an acid with an alkali?

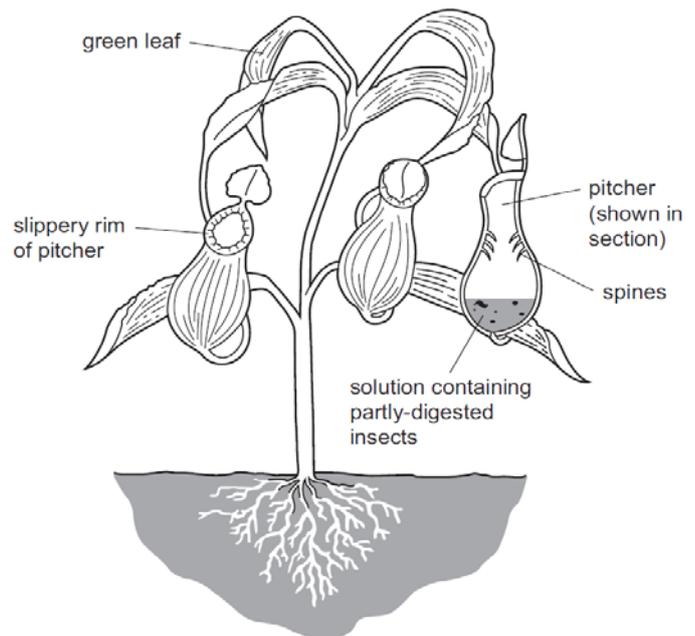
- (e) From the table select the most suitable indicator for his experiment. Explain your choice.

(f) Most indicators are made from plants. Describe how you would obtain an indicator from red cabbage.

Question Five [3 marks]

The diagram shows a pitcher plant, which grows in Malaysia and Indonesia.

The leaves of pitcher plants carry out photosynthesis, using carbon dioxide and water to make carbohydrates. They obtain carbon dioxide and water in the same way as other plants.



(a) Complete the table to show how the leaves obtain carbon dioxide and water. You do not need to write anything in the shaded box.

substance	source	part of the plant that absorbs it	process by which it is absorbed
carbon dioxide	air		
water			

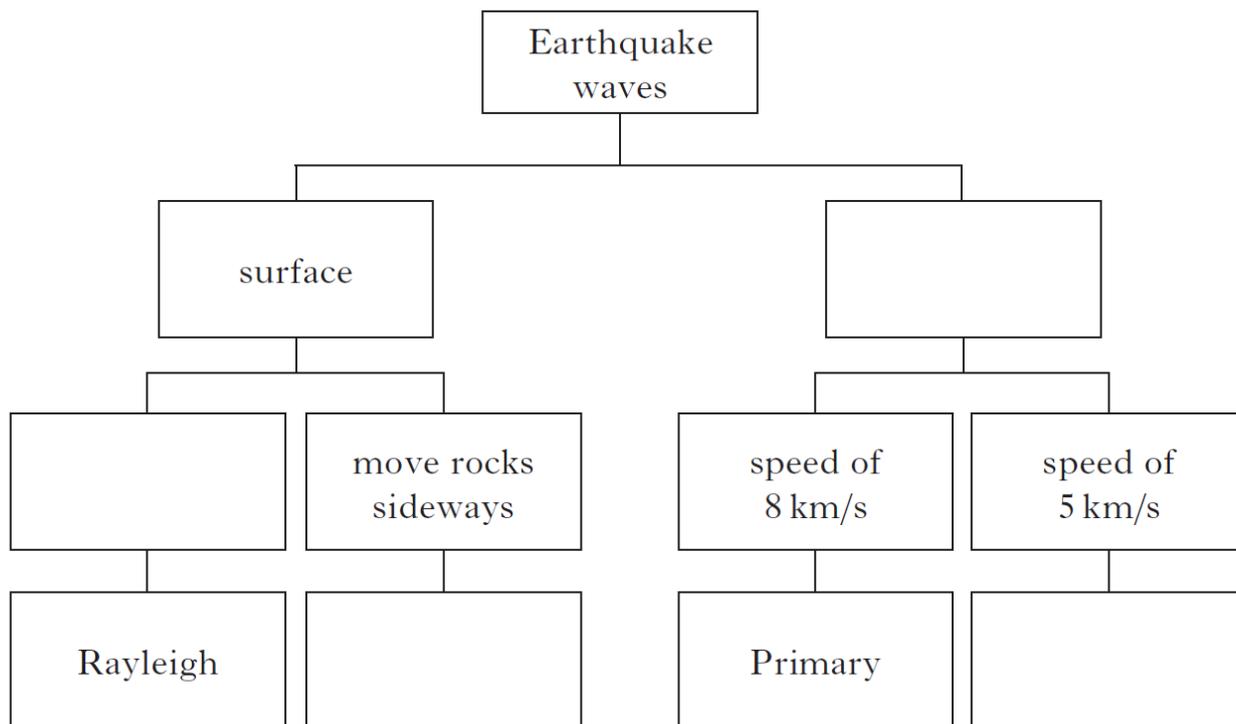
(b) Write the word equation for photosynthesis.

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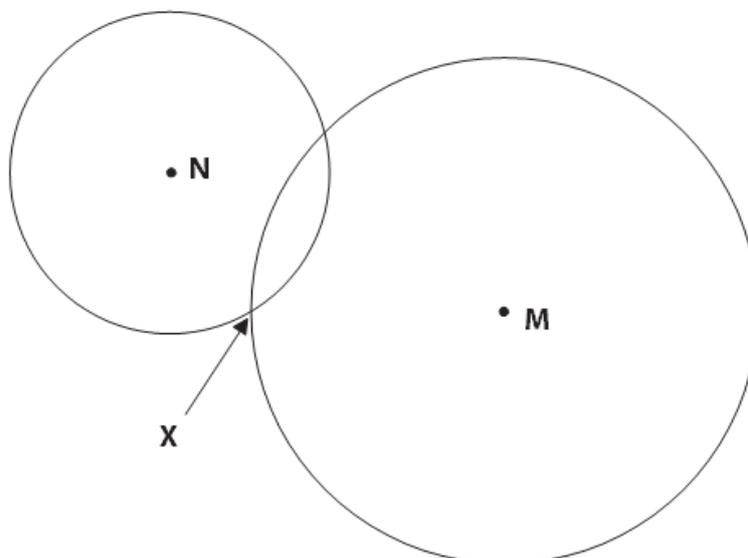
Question Six [4 marks]

Earthquakes cause different types of waves in rocks. These are either surface waves or body waves. There are two types of surface waves. Rayleigh waves move rocks upwards and Love waves move rocks sideways. Body waves can be Primary or Secondary. Primary waves travel at a speed of 8 km/s but Secondary waves travel at a speed of 5 km/s.

(a) Use this information to complete the following key.



The diagram shows circles drawn around two research stations, M and N. The stations are for detecting earthquakes. Each circle shows the distance of the earthquake from that station.



Two students discuss the diagram.

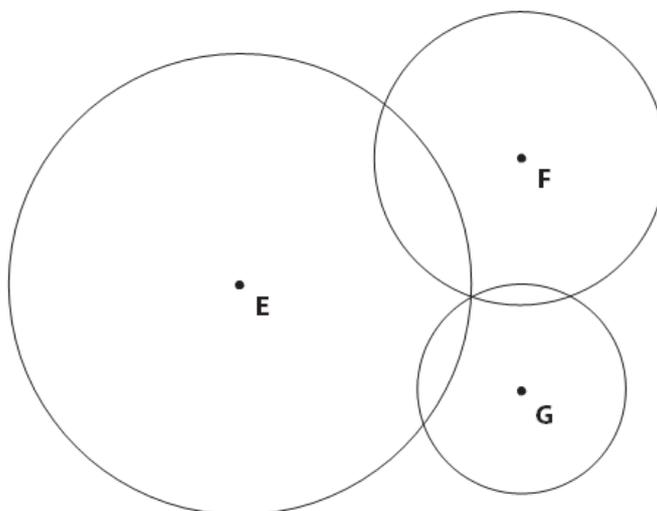
Student A said: the earthquake **must** have been at X.

Student B said: the earthquake **might** have been at X.

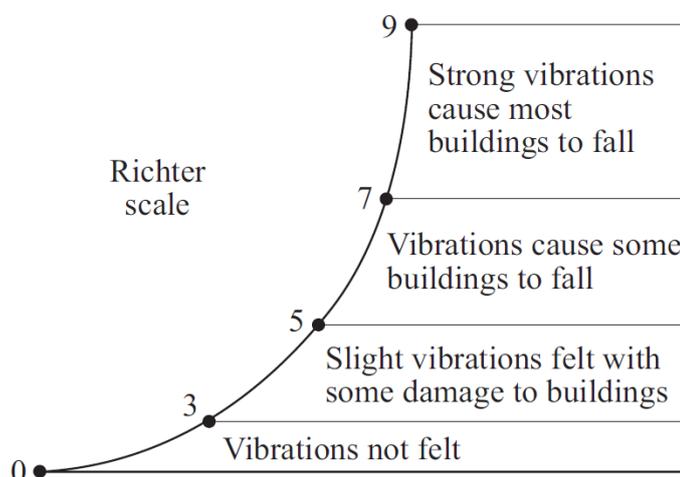
(b) Explain why the statement from student B is better.

The diagram shows circles drawn round three research stations, E, F and G, for another earthquake.

(c) Draw an X on the diagram to show where this earthquake probably happened.



In 1935 C.F. Richter designed a scale for comparing the size of earthquakes.

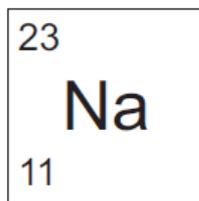


(d) A newspaper reported that an earthquake off the coast of Wanganui had caused plaster to come down from ceilings, house tiles to loosen and church bells to ring. Draw a ring around the number below which **best shows** the size of the earthquake.

1 4 6 8

Question Seven [4 marks]

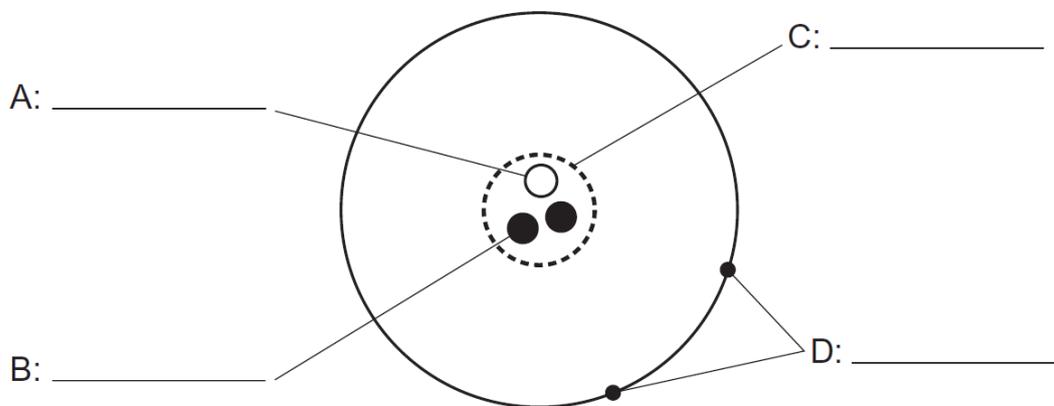
Here is some information about an atom of sodium. It has **eleven** (11) electrons.



- (a) Using the information, explain why sodium is found in Group 1 **and** Period 3 of the periodic table.

Group 1 because....
Period 3 because...

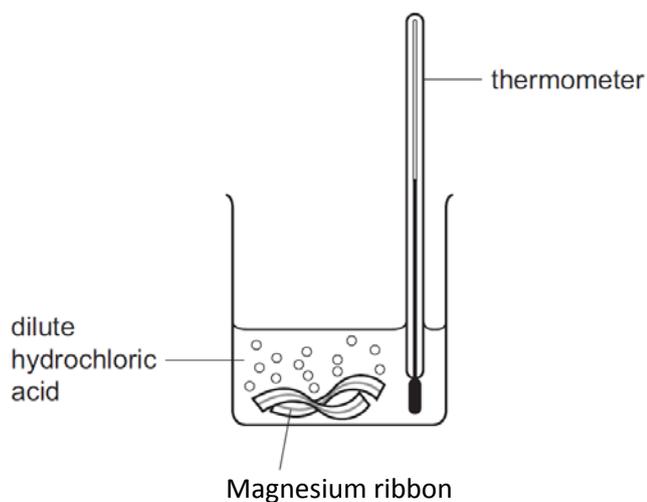
The diagram illustrates an atom. Atoms are neutral.



- (b) Complete the diagram by writing in the spaces above, the four missing labels.
- (c) Explain why atoms are neutral.

Question Eight [4 marks]

A student added a couple of big pieces of magnesium ribbon to dilute hydrochloric acid. During the reaction, the thermometer reading changed.



(a) Write down two observations which show that a chemical change occurs when magnesium is added to dilute hydrochloric acid.

1.
2.

(b) Name the gas that is given off in this reaction and describe the test for this gas.

Name of gas:
Test:
Positive result:

(c) Explain why the pH of the mixture **increases** during the reaction.

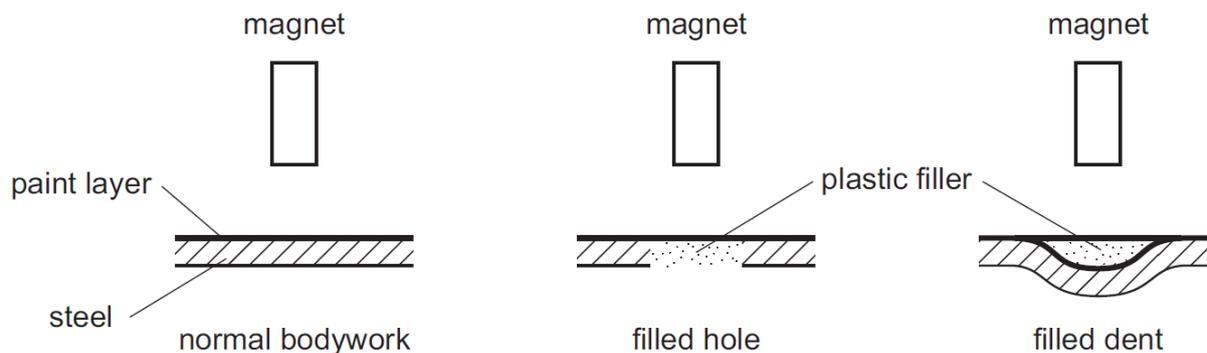
Question Nine [4 marks]

The bodywork of a car is usually made from steel. Steel is an alloy of iron.

If part of the bodywork goes very rusty it is usually removed and replaced with plastic filler, before being painted.

A car mechanic can use a magnet to find out if parts of the bodywork of a car have been filled with plastic filler.

He tests three areas of a car by placing a magnet near the surface as shown in the diagram.



(a) Complete the table.

Area	Effect on magnet
normal bodywork	
filled hole	
filled dent	weakly attracted

(b) What assumption have you made about the properties of plastic filler?

(c) Would this method work if the bodywork was made of aluminium? Explain your answer.

(d) Suggest why the bodywork of some cars is made from aluminium rather than steel.

END OF EXAMINATION